

Prevalence of Text Neck Syndrome among Doctors

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ABSTRACT

Purpose: The aim of this study was to investigate the prevalence of text neck syndrome (TNS) among doctors of North India and to assess the impact of increase in duration of time spent with mobile phones on TNS. **Methods:** The present study is an observational cross-sectional questionnaire based survey that included doctors practicing in North India. An electronic survey of 28 questions consisting of open-ended, closed-ended questions, and five-point Likert scale questions was developed using Google Form, which was sent to all the participants on October 19, 2020 through social media. Logistic regression analysis was performed to find relationship between discrete variables. The independence of attributes was measured through chi-squared test. **Results:** There was significant increase in the duration of mobile usage after lockdown as compared with pre lockdown period [$\chi^2 = 68.87$; $df = 16$; $p < 0.001$]. There were more complaints of neck pain in respondents whose duration of mobile usage per day was greater than 5-6 hr [odds ratio = 9.6; $p = 0.005$]. There was no significant difference between time duration of mobile usage across gender [$\chi^2 = 8.41$; $df = 4$; $p < 0.08$]. Similarly, There was no significant difference between time duration of mobile usage across gender in prelockdown period [$\chi^2 = 3.97$; $df = 4$; $p < 0.41$], while males reported to spend more time on mobile during post lockdown period [$\chi^2 = 8.41$; $df = 4$; $p < 0.08$]. **Conclusion:** We ascertained a statistically significant increase in TNS after lockdown during unrivaled era of COVID-19 pandemic which was associated with more exposure to mobile phones. Additionally we confirmed that, there was no significant difference between time duration of mobile usage across gender.

Keywords: Text neck syndrome, Mobile phones, Nomophobia.

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INTRODUCTION

In the present era, mobile phones are the most admired gadgets for sharing information and other daily activities. With an enhanced application in the last two decades, it has become an integral part of

life. Mobile phone has emerged as a significant tool for healthcare professionals because it is as good as a portable computer.^{1,2} The life of present generation has become more comfortable, commodious and more securer with the usage of mobile phones. However, extravagant usage of mobile phone has contributed to miserable health of the mobile-user.³⁻⁵ Mobile phones have become so indistinctive that surviving two days without a smart phone is like enduring disarmed in a battle zone. Though the invention of smart phone was impressive but its unethical use has resulted in long term calamitous outcome. “Blackberry thumb” and “iPad hand” are two instances of its precarious outcome.

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It has been advocated in studies that persistent smart phone practice can contribute to the evolution of musculoskeletal disorders.^{6,7}

Dr. Dean L. Fishman first coined the term Text Neck Syndrome (TNS) which occurs as a result of overuse injury. When the mobile phone is held in wrong posture, there is flattening of normal curvature of cervical spine due to forward flexion of the neck, which ultimately leads to severe musculoskeletal pain along with upper back pain. TNS is said to be associated with nomophobia in literature.⁸⁻¹⁰

Of late the 2019-novel coronavirus (2019-nCoV) or coronavirus disease (COVID-19) has happened as the third epidemic of respiratory coronavirus which was mainly centered in Wuhan province, China.¹¹ Enormous opportunities offered by smartphones in these unprecedented times of COVID-19 have been confirmed in a recent study.¹²

In these unrivaled times of COVID-19, TNS is a springing up problem with an immense global impact. There is a dearth of data regarding preponderance of TNS among doctors.

MATERIALS AND METHODS

Aim of the study

The aims of the study are as follows:

- (i) To assess the prevalence of text neck syndrome among doctors of North India.
- (ii) To assess the impact of increase in duration of time spent with mobile phones on text neck syndrome.
- (iii) To assess the gender based difference of TNS.

Study design and sampling

The present study is an observational cross-sectional survey that included doctors practicing in North India. The study was conducted after taking permission from Institutional Ethics Committee (3931 MC/EC/2017). An electronic survey of 28 questions consisting of open-ended, closed-ended questions, and five-point Likert scale questions was developed using Google Form, which was sent to all the participants on October 19, 2020 through social media (WhatsApp). The survey was concluded on October 26, 2020, for further analysis. Anonymity of the respondents was maintained.

Study population/responders

Responders were doctors who are practicing in North India only.

Inclusion criteria

Completely filled questionnaire were taken into consideration for analysis.

Exclusion criteria

Incompletely filled questionnaire were excluded from the study. Responses obtained after the closure date of the survey were discarded. Participants with past history of neck pain due to any trauma to cervical spine or any central nervous system disorder were also excluded from the study.

Sample size: Sample size was calculated as 94 participants as per previous study¹¹ showing the prevalence of text neck as 46% for 80% power, 0.05 α error and 10% relative error, which was further rounded off to 100.

Statistical analysis

The questionnaire contains responses on nominal and ordinal scale. The descriptive statistics has been measured in percentages and 95% confidence interval, assuming binomial distribution. Logistic regression analysis was performed to find relationship between discrete variables. The independence of attributes was measured through chi-squared test. The statistical level of significance was considered at 5%. The MATLAB 2016a and JASP 0.11.1.0 statistical package were used for statistical analysis.

RESULTS

The survey was sent through social media (WhatsApp) to 100 randomly selected doctors, 92 respondents replied back. 85 completely filled responses were taken into consideration for further analysis, while 7 incompletely filled responses were excluded from the study. 34 respondents were female doctors while 51 were male. Male preponderance (60%) was seen in our study.

Maximum number of respondents belonged to <30 year of age group (55.29%) followed by 31- 50 years of age group (31.76%). 90.58% of respondents were from Rajasthan state. Age- wise distribution of participants ($n= 85$) has been depicted in [Table 1].

The literal meaning of “Nomophobia” or “No mobile phobia” is the fear of being out of mobile phone contact”. 58.82 % of doctors were unaware of the term nomophobia. However, 55.29% of respondents used to keep their phone at all the times with them. 37.64% respondents had sleep disturbances due to excessive phone use.

Table 1: Shows state and age wise distribution of participants (n= 85).

Variable	Options	Percent (%)	95% CI	
			LL	UL
State	Chandigarh	1.176	0.03	6.40
	Chhattisgarh	1.176	0.03	6.40
	Delhi	2.353	0.30	8.20
	Madhya Pradesh	2.353	0.30	8.20
	Punjab	1.176	0.03	6.40
	Rajasthan	90.588	82.30	95.80
	Uttar Pradesh	1.176	0.03	6.40
Age	31- 50	31.765	22.1	42.8
	51 -70	10.588	5	19.2
	<30	55.294	44.1	66.1
	>70	2.353	0.3	8.2
Sex	Male	60	48.8	70.5
	Female	40	29.5	51.2

A bulk of doctors (58.33%) were unaware of the term TNS. Nevertheless, 27.05 % of doctors were having neck pain associated with excessive use of mobile phones. 43% respondents denied but, 17.64 % agreed that their neck pain interferes with their daily, social and recreational activities. The severity of neck pain reported by 32.9% of respondents was mild while 8.20% reported moderate severity.

Responses of the participants from the questionnaire has been elaborated in [Table 2], [Table 3] and [Figure 1] and [Figure 2].

In the unprecedented time of COVID-19 pandemic, we faced situations like lockdown which has cut down almost all social gatherings. Mobile has helped a lot in connecting socially in these situations. The persons spending 'less than 2 hr' on mobile decreased from 36.47% to 11.76 % and those spending 'more than 8 hr' increased from 3.52% to 14.11%. There was significant increase in the duration of mobile usage after lockdown as compared with pre lockdown period [$c^2 = 68.87$; $d_f = 16$; $p < 0.001$]. (Table 4 and 5) There were more complaints of neck pain in respondents whose duration of mobile usage per day was greater than 5-6 hr [odds ratio = 9.6; $p = 0.005$], while no significant relationship was found between mobile usage and other symptoms that include, frequent headaches, back pain, dizziness and weakness.

We also tried to find out association of prevalence of TNS with gender.

There was no significant difference between time duration of mobile usage across gender in prelockdown

period [$c^2 = 3.97$; $d_f = 4$; $p < 0.41$], while males reported to spend more time on mobile during post lockdown period [$c^2 = 8.41$; $d_f = 4$; $p < 0.08$] (Table 6). The knowledge about text neck syndrome did not differ significantly between females (48%) and males (37%) [$c^2 = 1.04$; $d_f = 1$; $p < 0.31$].

DISCUSSION

The prevalence of neck pain in our study was 27.05 % which is less than a study in which 46% of the study population reported neck pain due to prolonged smartphone use.¹⁰ Other previously published literature also found higher incidence of TNS in their study.^{13,14}

Maximum doctors used to spend 2-4 hr with mobile phones while after lockdown we could appreciate that, there was a statistically significant increase in the duration of mobile usage to 5-6 hr. Additionally, doctors with increased mobile usage complained more of neck pain (>5-6) hr ($p = 0.005$). Similar findings were reported previously.^{10,13,14}

Nevertheless, there was no significant relationship between mobile usage and other associated symptoms including frequent headaches, back pain, dizziness, and weakness. Ahmed and colleagues also emphasized that text neck syndrome and SMS thumb are seen in nomophobic students.¹⁰

In a survey by Al- Haldidi *et al.*, a significant difference between gender was confirmed, as females were having more screen time to mobile phones as compared to males.¹⁴ This was confirmed in previous literature also. This was in contradiction to outcomes of our study. We found in our study that, there was no significant difference between time duration of mobile usage across gender and no significant difference was found between gender about knowledge of text neck syndrome.

During this unprecedented time of COVID-19 pandemic, most of our daily activities relied upon mobile phones, whether it be recreation or study. It is a critical situation, yet with unanswered questions. It might take another couple of months to normalize our daily life.

However, TNS can be trimmed down by adopting some preventive measures including lifestyle changes and holding smartphone in a correct posture. Long-term exposure to smart phones should be strictly prohibited. In our study, 52.9 % of answerers confirmed that they knew the correct posture to hold mobile in their hand.

Early reports attributed that a stationary and flexed spinal stance while texting on mobile phones highly contributes to TNS.^{15,16} Nonetheless, the exceptional findings of Damasceno and colleagues have challenged

Table 2: Responses of the participants from Question1 to 12 (n =85).

Question Number	Description	Options	Percent	95% CI	
				LL	UL
1	Do you frequently SMS or use social networking while doing clinical work.	Agree	24.706	16.00	35.30
		Disagree	42.353	31.70	53.60
		Neutral	18.824	11.20	28.80
		Strongly agree	3.529	0.70	10.00
		Strongly disagree	10.588	5.00	19.20
2	Do you feel nervous if you fail to receive timely response on phone	Agree	30.588	21.00	41.50
		Disagree	32.941	23.10	44.00
		Neutral	12.941	6.60	22.00
		Strongly agree	4.706	1.30	11.60
		Strongly disagree	18.824	11.20	28.80
3	It will scare/worry you if you are running out of your battery or out of signal in phone	Agree	52.941	41.80	63.90
		Disagree	25.882	17.00	36.50
		Neutral	8.235	3.40	16.20
		Strongly agree	5.882	1.90	13.20
		Strongly disagree	7.059	2.60	14.70
4	Would you be uncomfortable if you could not stay upto date with social media and online networks.	Agree	24.706	16.00	35.30
		Disagree	40	29.50	51.20
		Neutral	15.294	8.40	24.70
		Strongly agree	3.529	0.70	10.00
		Strongly disagree	16.471	9.30	26.10
5	You keep your phone at all the times with you	Agree	55.294	44.10	66.10
		Disagree	16.471	9.30	26.10
		Neutral	12.941	6.60	22.00
		Strongly agree	9.412	4.20	17.70
		Strongly disagree	5.882	1.90	13.20
6	Would you panic if you come to know that your mobile data is going to be exhausted	Agree	33.333	23.10	44.00
		Disagree	33.333	23.10	44.00
		Neutral	13.095	7.50	23.40
		Strongly agree	3.571	0.70	10.00
		Strongly disagree	16.667	9.30	26.10
7	You answer immediately when your phone rings	Agree	35.294	25.20	46.40
		Disagree	21.176	13.10	31.40
		Neutral	29.412	20.00	40.30
		Strongly agree	5.882	1.90	13.20
		Strongly disagree	8.235	3.40	16.20
8	You would be in stress if you could not use your phone for a week	Agree	45.882	35.00	57.00
		Disagree	24.706	16.00	35.30
		Neutral	9.412	4.20	17.70
		Strongly agree	14.118	7.50	23.40
		Strongly disagree	5.882	1.90	13.20

continued...

Table 2: Cont'd.

Question Number	Description	Options	Percent	95% CI	
				LL	UL
9	Do you have sleep disturbances due to excessive phone use	Agree	37.647	27.40	48.80
		Disagree	24.706	16.00	35.30
		Neither disagree nor agree	9.412	4.20	17.70
		Strongly agree	9.412	4.20	17.70
		Strongly disagree	18.824	11.20	28.80
10	Do you feel that your neck pain interferes with your daily, social and recreational activities	Agree	17.647	10.20	27.40
		Disagree	43.529	32.80	54.70
		Neutral	20	12.10	30.10
		Strongly agree	1.176	0.03	6.40
11	Are you feeling anxious and depressed due to neck pain	Strongly disagree	17.647	10.20	27.40
		Agree	10.588	5.00	19.20
		Disagree	41.176	30.60	52.40
		Neutral	24.706	16.00	35.30
12	Do you feel that your work has been affected due to neck pain	Strongly agree	1.176	0.03	6.40
		Strongly disagree	22.353	14.00	32.70
		Agree	12.941	6.60	22.00
		Disagree	44.706	33.90	55.90
		Neutral	18.824	11.20	28.80
		Strongly agree	2.353	0.30	8.20
		Strongly disagree	21.176	13.10	31.40

Table 3: Show's responses of the participants from Question13 to 23 (n =85).

Question Number	Description	Options	Percent	95% CI	
				LL	UL
13	Do you know about nomophobia	No	58.824	47.60	69.40
		Yes	41.176	30.60	52.40
14	Do you have neck pain due to excessive use of mobile	No	72.941	62.20	82.00
		Yes	27.059	18.00	37.80
15	Have you heard about TEXT NECK SYNDROME	No	58.333	47.10	69.00
		Yes	41.667	31.00	52.90
16	Do you know the correct posture to hold mobile in your hand	No	47.059	36.10	58.20
		Yes	52.941	41.80	63.90
17	Vision Problem	No	64.706	53.60	74.80
		Yes	35.294	25.20	46.40
18	Neck Pain	No	74.118	63.50	83.00
		Yes	25.882	17.00	36.50
19	Frequent Headaches	No	80	69.90	87.90
		Yes	20	12.10	30.10
20	Back Pain	No	82.353	72.60	89.80
		Yes	17.647	10.20	27.40
21	Dizziness	No	82.353	72.60	89.80
		Yes	17.647	10.20	27.40
22	Weakness	No	88.235	79.40	94.20
		Yes	11.765	5.80	20.60
23	Symptoms	No	42.353	31.70	53.60
		Yes	57.647	46.40	68.30

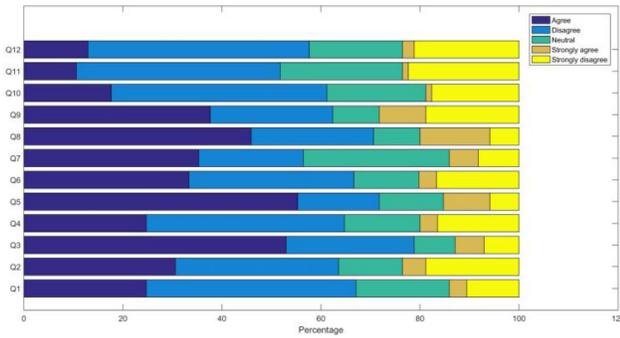


Figure 1: Responses of the participants from the questionnaire has been elaborated.

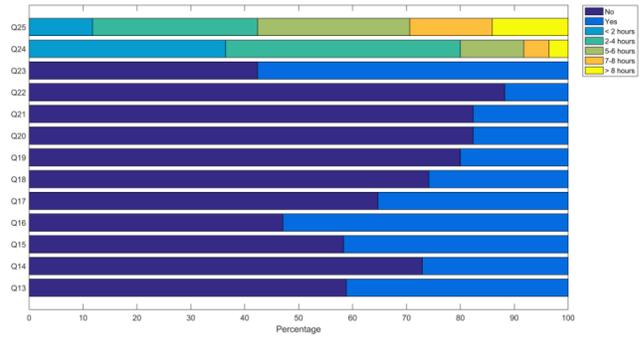


Figure 2: Responses of the participants from the questionnaire has been elaborated.

Table 4: Shows responses of the participants from Question 24 to 28 (n =85).

Question Number	Description	Options	Percent	95% CI	
				LL	UL
Q 24	How much time you used to spend with mobile before lockdown	2-4 hr	43.529	32.80	54.70
		5-6 hr	11.765	5.80	20.60
		7-8 hr	4.706	1.30	11.60
		<2 hr	36.471	26.30	47.60
		>8 hr	3.529	0.70	10.00
Q 25	How much time you are spending with mobile after lockdown	2-4 hr	30.588	21.00	41.50
		5-6 hr	28.235	19.00	39.00
		7-8 hr	15.294	8.40	24.70
		<2 hr	11.765	5.80	20.60
		>8 hr	14.118	7.50	23.40
Q26	How would you rate your severity of neck pain	Mild	32.90	23.10	44.00
		Moderate	8.20	3.40	16.20
		No pain	58.80	47.60	69.40
		Always	2.40	0.30	8.20
Q27	Do you use any of the following neck exercises to mitigate neck pain	Never	34.10	24.20	45.20
		Occasionally	31.80	22.10	42.80
		Often	9.40	4.20	17.70
		Sometimes	22.40	14.00	32.70
		Always	3.60	0.70	10.10
Q28	Do you self-medicate to get rid of neck pain	Never	59.50	48.30	70.10
		Occasionally	14.30	7.60	23.60
		Often	1.20	0.03	6.50
		Sometimes	21.40	13.20	31.70

the impression that neck posture during mobile phone texting is assorted with the developing prevalence of neck pain.¹⁷

Warming up of neck muscles, massaging and stretching exercises have been suggested to reduce neck pain. Even consumption of over the counter drugs, opioids, other analgesics, cervical epidural steroid injections and

injections at the trigger point have been proposed for relieving neck pain.¹⁴⁻¹⁶

The majority of the doctors have consented that they used to perform mild neck exercises to get rid of neck pain but, only a few of them had to consume self medication for the same. It is known that, flexed spinal posture which contributes most to TNS should be avoided.^{15,16}

Table 5: Table showing significant increase in the duration of mobile usage after lockdown as compared with pre lockdown period.

Contingency Table						
Prelockdown						
Post lockdown	< 2 hr	2-4 hr	5-6 hr	7-8 hr	>8 hr	Total
< 2 hr	9	1	0	0	0	10
2-4 hr	16	10	0	0	0	26
5-6 hr	4	16	4	0	0	24
7-8 hr	1	8	3	1	0	13
>8 hr	1	2	3	3	3	12
Total	31	37	10	4	3	85

Table 6: Difference between time duration of mobile usage across gender in pre and post- lockdown period.

	Sex	2-4 hr	5-6 hr	7-8 hr	<2 hr	>8 hr	Total
Prelockdown	F	18	3	1	12	0	34
	M	19	7	3	19	3	51
	Total	37	10	4	31	3	85
Postlockdown	F	13	8	6	6	1	34
	M	13	16	7	4	11	51
	Total	26	24	13	10	12	85

It has been described that although the weight of our heads is approximately between 10lb and 12lb, but as we angle them down to operate our phones, the effectual weight on our neck increases to 27 lb at a 15-degree angle which rises up to 60 lb at an angle of 60 degree. Thus we should hold our mobile mobile phones in a relaxed posture to avoid load on our neck muscles.⁶

We all know that TNS has emerged as a global epidemic of the modern era of technology. Thus, awareness of TNS associated with nomophobia should be created amongst doctors as well as general population to avoid life-long chronic neck pain and other deformities related to musculoskeletal system.⁷⁻¹⁹

Limitations of the study

We have presented an original study that involved limited number of doctors of India only. This is a questionnaire based study in which we inquired about nomophobia and TNS and we could find significant association between increased duration of mobile phone usage and TNS only after the self reporting of answerers. The responders did not undergo any investigation for TNS. There is a possibility of underreporting of TNS cases. As TNS is a rising issue, we advocate prospective multicentric randomized controlled trials on large nomophobic population for validation of results of prevalence of TNS.

CONCLUSION

To the best of author's knowledge, this will be the first study to shed light on the prevalence of TNS among doctors of North India. Additionally, we ascertained a statistically significant increase in TNS after lockdown during unrivaled era of COVID-19 pandemic which was associated with more exposure to mobile phones. Additionally we confirmed that, there was no significant difference between time duration of mobile usage across gender.

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We wish to express our gratitude to all the doctors who have devoted their valuable time to answer the survey.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

Consent of participation and publication

The statement for consent of the respondent was mentioned during the survey.

Ethical statement

This is an electronic survey which involving doctors of India. There is no involvement of human or animal experiment. The identity of the respondents was

anonymized in the survey. An expedited clearance was obtained from the Institutional Review Board.(3931 MC/EC/2017)

Human and animal rights statements

There is no human or animal involved in any experiment in the present study.

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